nature portfolio

Peer Review File

Scoping Review of Artificial Intelligence via Mobile Technology and Social Media for Health in Africa

Corresponding Author: Dr Shakuntala Baichoo

This file contains all reviewer reports in order by version, followed by all author rebuttals in order by version.

Attachments originally included by the reviewers as part of their assessment can be found at the end of this file.

Version 0:

Reviewer comments:

Reviewer #1

(Remarks to the Author)
Thank you for the opportunity to review this article. This article highlights an important area of the application of AI to improve health in Africa. The scoping article and the methodology are sounds. The concerns are primarily with the recommendations. If you narrow the recommendations to the findings of the scoping review this will be a great paper.

1. Lack of diversity in social media platforms. Yes there are other platforms for social media, but there is no discussion of data sharing of different platforms for research. Before calling for diversity of platforms in research, does public information from the diverse platforms even allow this recommendation.

2. Geographic Equity in science investments. Yes investment is required and for high speed performance. Local data centers improve performance, but the authors miss the transformative nature of renting limited time anywhere in the world. Individual countries and institutes need less investment than occurred 10-20 years ago.

3. Data sharing for research, your last sentence said companies need to apply same policy to Africain researchers as western nations. The lack of publications is one sign but not definitive sign for a difference in data policies.

4. AI-assisted tools can both promote mis information and promote accurate information, the dual nature of the tools is missing.

Reviewer #2

(Remarks to the Author)
The manuscript is well-structured and presents relevant insights into applying AI, ML mobile technology, and social media in health in Africa. However, some areas require further refinement to enhance coherence and clarity in the study objectives results, and conclusions.
Introduction
• The title and content appear misaligned. The content of the paper focuses more on a scoping review of AI and ML applications via mobile technology and social media in Africa', and does not go into any evidence on how this 'improves health in Africa'. This is evident in lines 115–116 and 365–366.
• The introduction lacks study-specific definitions of key terms such as AI and ML, particularly in the African context. While definitions for social media and mobile technology are later included (lines 119–121), they should be introduced earlier to establish conceptual clarity.
Results:
• Add the use of mobile phones in the results introduction (lines 127 to 129).
• The paper mentions that 25% of authors were affiliated with African institutions (line 157) and goes on later to discuss the importance of engaging relevant African bodies. However, only 2 of the 8 authors who wrote this manuscript are affiliated with African institutions. Also, the paper mentions consultation with a librarian at Boston (line 388) on research strategy despite emphasizing the importance of engaging relevant African, community, scientists, etc. This critique, which comes out strongly in the discussion, could also apply to this paper. It may therefore help to de-emphasize it.

• The fourteen broad categories stated in line 189 are not clear in Table 2.
• Lines 191 to 203 interchange the terms algorithms and techniques while the table clearly defines what algorithms are and what techniques are. Consider revising it for ease of readability. For example in line 191, replace the word techniques with approaches or algorithms as reflected by Table 2, etc.
• Consider moving the section on the effectiveness of ML and AI methods (line 215) to appear before the section on social media platforms and mobile phone usage (line 205)
• Section on social media platforms and mobile phones (line 205) to include information on usage in urban vs rural settings. These technologies are not harmoniously applied across Africa, and they are relatively under-used in rural areas.
• Most of the results are skewed towards AI and ML.
Discussion
• Some discussion topics focus on areas that do not necessarily have strong evidence in the results of their research. Please keep the discussion focused on the implications of your results.
• Line 290: The rationale for introducing AI/ML is because we recognize that health is a complex adaptive system. However, AI/ML is mostly used to address specific sectors/programs (COVID-19, particularly diagnostics which is a simpler, and more linear approach not recognizing the complex nature of the health system. Consider bringing this discussion out clearly.
• Consider comparison with other regions within the discussions: How do the findings relate to other regions that have more advanced AI/ML applications?
• Discuss the issue of penetration of mobile technology and social media platforms in Africa. This can affect how the results should be interpreted. They are more individually used in urban areas and peri-urban settings – and are less available, or more commonly shared in rural settings.

Recommendation
• The 6 critical areas of focus are not linked to the discussion or the results. The rationale for these 6 areas needs to be built into the discussion. Currently, it is not clear whether there may be other critical areas left out, or even if these 6 areas are of equal importance (are they critical in all situations?)
• From your results, I thought you would be recommending comprehensive AI solutions that take cognizance of the complex nature of the health systems and services in Africa, as compared to a more simple, linear manner
Conclusion
• Should focus on what is the future – What are the implications of the findings for other countries – either in Africa for which there were no data and/or the rest of the world?

Reviewer #3

(Remarks to the Author)
I co-reviewed this manuscript with one of the reviewers who provided the listed reports. This is part of the Nature Communications initiative to facilitate training in peer review and to provide appropriate recognition for Early Career Researchers who co-review manuscripts.

Reviewer #4

(Remarks to the Author)
Initial comments
While I appreciate the work done by the authors, I am of the view that:
authors have not provided detailed noteworthy results in their study. The focus of the study was on AI , but scanty results were reported in that direction. A lot needs to be done on the subject since the extracted studies are still available to the authors.
This work could be significant of the review comments are heeded to, and necessary revisions made. authors made some interesting recommendations that were not clearly revealed by their study (at least in their findings). Since the data are still available, authors could flesh up their findings to support their recommendations.
The methods section could also be improved based on the review comments.

Topic
1. The topic should be modified to suit the content.

Abstract
1. The abstract does not capture a clear problem and gap to be filled by the study.
2. There is no information on the standard approach (or framework) used for the systematic /scopingreview. For instance, there is the popular PRISMA flow that is often used as an approach to the entire work selection process.
3. The findings in the abstract are not too compelling to arouse interest of readers and even policy-makers. Authors should rather provide key findings that are “heavy” relevance to the continent.

Introduction
1. In an attempt to establish a gap for this research, authors have not sufficiently linked the second and third paragraphs in page four. There is a clear disjoint. Examine these statements

“The utility of these digital tools extends to a host of applications, including disease management and diagnosis, tracking infectious disease trends and chronic disease risk factors, pharmacovigilance, and analyzing population dynamics during

public health crises. Similar tools have enabled organizations like the U.S. Centers for Disease Control (CDC) and WHO to use digital surveillance for early disease outbreak detection, affirming the importance of such tools for epidemic intelligence as recognized by the 2005 International Health Regulations.3,23,24 " AND

"However, comprehensive reviews on how AI has been used with mobile phones and social media for health research and applications in Africa have yet to be made available. Several reviews have focused on mobile phone use and social media applications for health in…".
There is no linkage between the two halves. Kindly reconcile.

2. There are no clear research questions that this review seeks to answer. Kindly provide clear research questions at the end of the introduction section. This help with readability and reading expectation. this has made it very difficult to benchmark the results against specific research questions.

Methodology
1. There is no clear and detailed methodology section. The methods have somewhat been combined with the results. This is problematic as it defeats the structure of scientific writing and systematic/scoping reviews.

2. Provide a detailed methods section that clearly spells out:
i. comprehensive search terms that represents all the needed components of the study (there is the need to bring all the names of the African countries in your search key terms)
ii. databases
iii. eligibility criteria
iv. inclusion criteria
v. exclusion criteria
vi. reliability of included studies
vii. thematic coding for analysis
viii. explanation to the PRISMA flow of studies selection process
ix. explanation and justification for the base year and year range.

Results
1. Figure (b) is confusing. This is because the study focuses on AI mixed with mobile phones and social media, but the figure only depicts mobile phones and social media.
2. Findings are insufficient on AI since that is the major focus of this study (at least from my reading). I expect findings such as the categories of usage (which has been reported but scantly discussed). Effectiveness of theses AI tools/approaches as opposed to just mobile phones and social media; Challenges in sing these AI tools/approached; possible solutions to the use of these AI tools/approaches.

Discussion
1. The discussion section is very scanty and uninformative. There should be more reflective and critical discourse on the subject.
2. Better for authors to separate discussions from limitations, and suggestions for future research.

Thank you for the opportunity to review your paper. I hope the paper could be improved to qualify for publication in this reputable journal.
Best wishes.

Version 1:

Reviewer comments:

Reviewer #1

(Remarks to the Author)
The necessary changes were made.

Reviewer #2

(Remarks to the Author)
Thank you for the revised article. It provides clarity to all the areas i had raised, and it is flowing better. I have no further

comments.

Humphrey Karamagi, and Anabay Mamo

Reviewer #3

(Remarks to the Author)
I co-reviewed this manuscript with one of the reviewers who provided the listed reports. This is part of the Nature Communications initiative to facilitate training in peer review and to provide appropriate recognition for Early Career Researchers who co-review manuscripts.

Reviewer #4

(Remarks to the Author)
I have gone through the revised version and am satisfied with the revisions made by the authors based on my comments.

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REVIEWER COMMENTS

Reviewer #1 (Remarks to the Author):

Thank you for the opportunity to review this article. This article highlights an important area of the application of AI to improve health in Africa. The scoping article and the methodology are sounds. The concerns are primarily with the recommendations. If you narrow the recommendations to the findings of the scoping review this will be a great paper.

1. Lack of diversity in social media platforms. Yes there are other platforms for social media, but there is no discussion of data sharing of different platforms for research. Before calling for diversity of platforms in research, does public information from the diverse platforms even allow this recommendation.

We thank the reviewer for this comment. We have cited studies that have used platforms like WhatsApp and Nairaland for research in Africa. Other platforms like Tiktok have an academic program that allows users to apply for data to use in academic research. It has been used in other contexts but not for studies focused on Africa. Also, our focus is not solely on using data posted by users on these platforms for research, but also on using these platforms as tools for generating data. The ethical and data protection issues noted are similar to those observed with other platforms and need to be addressed to ensure ethical and equitable use. We have added this information to the manuscript.

2. Geographic Equity in science investments. Yes investment is required and for high speed performance. Local data centers improve performance, but the authors miss the transformative nature of renting limited time anywhere in the world. Individual countries and institutes need less investment than occurred 10-20 years ago.

We appreciate the reviewer's insightful comment regarding the transformative potential of renting computational resources globally. Indeed, cloud-based services enable flexible access to high-performance infrastructure without the need for substantial local investment, which has significantly lowered barriers. However, according to a UNDP blog post based on an analysis conducted by Zindi (the largest professional network for data scientists in Africa), only five percent of Africans working on AI have access to needed compute resources. Some African AI experts have argued that local ownership of these resources is important for several reasons, including data sovereignty, control over sensitive health information, ease of innovation, and the ability to customize infrastructure to meet specific regional needs. Balancing the benefits of global resource rental with the strategic value of local investment is crucial to ensure sustainable and equitable health research infrastructure across Africa.

3. Data sharing for research, your last sentence said companies need to apply same policy to Africain researchers as western nations. The lack of publications is one sign but not definitive sign for a difference in data policies.

We thank the reviewer for the valuable comment on data sharing. While some of the authors have experiences that seem to suggest that it is easier to obtain certain African datasets while based in a western institution compared to colleagues living on the continent, we do not have any published studies to support this statement. We have deleted this sentence and edited the section to focus more on equitable access to data and publications.

4. AI-assisted tools can both promote mis information and promote accurate information, the dual nature of the tools is missing.

We edited that section of the manuscript to read as follows:

"The application of AI and social media to improve public understanding and accessibility of scientific and health communications did not receive enough attention in the reviewed studies. For example, although information about vaccine research is publicly available, mistrust of science and misinformation persists online and offline. AI-assisted tools can analyze misinformation prevalent in specific communities and address it with simple, understandable messages, which can remove obstacles to knowledge about disease and health. For example, the WHO collaborated with WhatsApp during the pandemic to address misinformation. [86,87] This approach can be extended to focus on specific communities, African languages and diseases. Collaborations between public health authorities and tech companies are not only essential during public health emergencies. They can be used to cultivate a culture in which scientific and health information is shared broadly to increase awareness and trust in science. While AI tools are capable of promoting beneficial public health messages, the same tools can also promote misinformation, which poses complex ethical challenges that require transparent regulation, ethical oversight, and strategies to harness AI's benefits while mitigating harm."

Reviewer #2 (Remarks to the Author):

The manuscript is well-structured and presents relevant insights into applying AI, ML mobile technology, and social media in health in Africa. However, some areas require further refinement to enhance coherence and clarity in the study objectives results, and conclusions.

Introduction

• The title and content appear misaligned. The content of the paper focuses more on a scoping review of AI and ML applications via mobile technology and social media in Africa', and does not go into any evidence on how this 'improves health in Africa'. This is evident in lines 115–116 and 365–366.

We have changed the title to: "A Scoping Review of the Use of Artificial Intelligence and Machine Learning via Mobile Technology and Social Media for Health Research in Africa", which better aligns with the content of the paper.

• The introduction lacks study-specific definitions of key terms such as AI and ML, particularly in the African context. While definitions for social media and mobile technology are later included (lines 119–121), they should be introduced earlier to establish conceptual clarity.

Thank you for the suggestion. We have edited the section to read as follows:

"...Efficiently processing and gleaning health insights from these large digital datasets requires machine learning (ML) and artificial intelligence (AI). AI involves computer systems performing tasks requiring human intelligence, while ML, a subset of AI, involves computer models and algorithms that learn and improve from data. In Africa, AI and ML adoption offers unique opportunities and challenges due to varied technology infrastructure, data availability, and socio-economic conditions. The integration of AI/ML tools with social media and mobile technologies has the potential to overcome constraints, such as limited healthcare access points and professionals and to bridge gaps in healthcare delivery."

Results:

• Add the use of mobile phones in the results introduction (lines 127 to 129).

We added mobile phones to the sentence:

"We summarize significant findings focusing on study characteristics, health conditions and populations studied, types of AI and machine learning methods, uses of mobile phones and diversity in social media platforms."

• The paper mentions that 25% of authors were affiliated with African institutions (line 157) and goes on later to discuss the importance of engaging relevant African bodies. However, only 2 of the 8 authors who wrote this manuscript are affiliated with African institutions. Also, the paper mentions consultation with a librarian at Boston (line 388) on research strategy despite emphasizing the importance of engaging relevant African, community,

scientists, etc. This critique, which comes out strongly in the discussion, could also apply to this paper. It may therefore help to de-emphasize it.

We appreciate the reviewer's thoughtful comment. To clarify, all authors except two have affiliations with African institutions but only three mentioned these affiliations in the initial submission. This was an oversight especially given our critique of author affiliations. All authors have listed their African institutional affiliations, even if they are currently or were previously based outside the continent. Also, all authors except one identify as African.

• The fourteen broad categories stated in line 189 are not clear in Table 2.

Thank you for bringing this typo to our attention. We have revised the sentence to clarify that Table 2 presents the seven broad categories of AI and machine learning methods identified, along with the specific algorithms and platforms used in the reviewed studies.

• Lines 191 to 203 interchange the terms algorithms and techniques while the table clearly defines what algorithms are and what techniques are. Consider revising it for ease of readability. For example in line 191, replace the word techniques with approaches or algorithms as reflected by Table 2, etc.

The text has been edited as follows:

"Deep learning algorithms were used in 9 studies (31%), while supervised learning techniques, including machine learning regression, were the most common, appearing in 16 studies (55.2%) with regression methods used in 11 studies (38%). Unsupervised learning methods, such as topic modeling, were applied in 4 studies (14%). Spatial modeling and other natural language processing methods were each used in one study (3.44%).

Within these broader AI and machine learning categories, we identified 47 distinct algorithms or approaches. The most widely used algorithms included Support Vector Machines (6 studies, 9.8%), Convolutional Neural Networks (5, 8.2%), Latent Dirichlet Allocation (4, 6.5%), K-Nearest Neighbors (2, 3.3%), and Random Forest (2, 3.3%). Other algorithms used once encompassed tree-based models (e.g., Boosted Regression Trees), author-developed algorithms, neural network autoregression, language models such as RoBERTa, and other regression techniques. One study mentioned deep learning without specifying the particular algorithm employed."

• Consider moving the section on the effectiveness of ML and AI methods (line 215) to appear before the section on social media platforms and mobile phone usage (line 205)

We appreciate the reviewer's suggestion regarding the reordering of sections. After careful consideration, we decided that the current sequence of discussing social media platforms and mobile phone usage prior to the effectiveness of ML and AI methods provides a more logical flow by first establishing the context of the tools before evaluating their effectiveness. The ML and AI algorithms are used via social media and mobile technologies. We have therefore retained the original order to maintain clarity and coherence in the presentation.

• Section on social media platforms and mobile phones (line 205) to include information on usage in urban vs rural settings. These technologies are not harmoniously applied across Africa, and they are relatively under-used in rural areas.

We thank the reviewer for this comment. We have added the following sentence and reference to the Discussion:

"Furthermore, social media and mobile phone use in Africa is uneven, with urban areas having better access and engagement than rural communities, where connectivity, literacy, and cost barriers limit digital inclusion and development.[68,69]

• Most of the results are skewed towards AI and ML.

The reviewer's comment is unclear. The primary aim of this paper is to explore the use of AI and ML via mobile technology and social media for health in Africa. Accordingly, much of the results focus on AI and ML. We would appreciate additional information from the reviewer to respond appropriately.

Discussion

• Some discussion topics focus on areas that do not necessarily have strong evidence in the results of their research. Please keep the discussion focused on the implications of your results.

We have tied all discussion topics listed under Gaps and Policy Recommendations back to our findings. We would appreciate any additional comments from the reviewer if there is anything we missed.

• Line 290: The rationale for introducing AI/ML is because we recognize that health is a complex adaptive system. However, AI/ML is mostly used to address specific sectors/programs (COVID-19, particularly diagnostics which is a simpler, and more linear approach not recognizing the complex nature of the health system. Consider bringing this discussion out clearly.

Thank you for this important observation. We agree that health systems are inherently complex adaptive systems, and that the use of AI/ML in health has often focused on specific, more linear applications such as diagnostics of COVID-19. To address this comment, we have revised this part of the paper as follows:

"While infectious diseases like malaria and COVID-19 have been the focus of published studies that use AI with mobile phones and social media, there is a growing need to apply these methods to better capture the complex adaptive nature of health systems and the increasing burden of NCDs. The application of AI and ML for health in Africa requires a systems approach; one that moves beyond simple linear applications to consider the present realities of the healthcare infrastructure and system level challenges within a specific context. The incidence of and mortality from non-communicable diseases (NCDs) like cancer, cardiovascular disease, and type-2 diabetes are increasing in Africa.[74–76] There are opportunities for using AI to screen for and support the treatment of some NCDs, including self-management of specific disorders by enhancing early disease identification and management.[77] The development of mobile health solutions that can be adapted to areas with restricted internet connection should be prioritized. Researchers can use social media and mobile phones to capture individual and population behaviours, such as eating and exercise patterns, to study and predict risks for disease.[78] These tools can also nudge at-risk individuals to seek screening and treatment. Policymakers can facilitate the use of these technologies by creating data policies, allocating funding and other incentives that encourage usage. Furthermore, policymakers, researchers and clinicians can define how research can be translated into practical clinical and public health applications."

• Consider comparison with other regions within the discussions: How do the findings relate to other regions that have more advanced AI/ML applications?

Thank you for this suggestion. While we recognize that comparisons with regions having more advanced AI/ML applications could be useful depending on the aim of the study, the primary focus of our study is on the unique challenges and opportunities within the African continent. Maintaining this focus allows us to address region-specific factors and disparities, such as infrastructure, disease burden, and policy environments, which are critical for understanding AI/ML adoption in these settings.

• Discuss the issue of penetration of mobile technology and social media platforms in Africa. This can affect how the results should be interpreted. They are more individually used in urban areas and peri-urban settings – and are less available, or more commonly shared in rural settings.

Thank you for raising this important point. We have addressed the issue of mobile technology and social media penetration in Africa, including the urban versus rural

differences in usage patterns. This discussion highlights how disparities in access and usage influence the interpretation of our results, particularly the more individual use in urban and peri-urban areas compared to shared or limited access in rural settings.

Recommendation

• The 6 critical areas of focus are not linked to the discussion or the results. The rationale for these 6 areas needs to be built into the discussion. Currently, it is not clear whether there may be other critical areas left out, or even if these 6 areas are of equal importance (are they critical in all situations?)

We added the following sentences:

"…These six areas of focus reflect key challenges and opportunities identified through our review of AI/ML use via mobile technology and social media in African health contexts. While these areas may vary in importance depending on specific settings or challenges, they collectively represent foundational elements essential for enabling equitable, effective, and sustainable adoption of these tools. We acknowledge that other areas may emerge as critical in different contexts, and therefore encourage ongoing evaluation and adaptation of priorities as technologies and health systems evolve.

• From your results, I thought you would be recommending comprehensive AI solutions that take cognizance of the complex nature of the health systems and services in Africa, as compared to a more simple, linear manner.

Thank you for your insightful observation. Our study indeed recognizes the complex and adaptive nature of health systems in Africa. While many current AI applications tend to focus on specific, more linear problems, such as diagnostics, we emphasize the importance of developing comprehensive AI solutions that account for this complexity. Although our recommendations highlight targeted, feasible interventions based on available evidence, we also advocate for advancing AI approaches that integrate multiple factors and system-level dynamics to better support health systems strengthening across the continent. We have clarified this point further in the discussion to reflect the need for holistic and adaptive AI strategies. We made edits to the "Disparities in Diseases and Health Conditions" section based on your previous comments.

Conclusion

• Should focus on what is the future – What are the implications of the findings for other countries – either in Africa for which there were no data and/or the rest of the world?

Thank you for this valuable suggestion. We edited the Conclusion as follows:

"In this scoping review, we aimed to evaluate the confluence of AI and two important tools shaping health globally - social media and mobile phones - to study health and disease dynamics in Africa. Our findings demonstrate an interest in developing effective solutions that address various health challenges in Africa, however a systems-level focus and policies to address identified gaps are needed to take advantage of these tools to improve health on the continent. Specifically, we discuss six focal areas including, a need for geographic diversity, limited focus on infectious diseases, lack of diversity in social media platforms, digital literacy and access, and data sharing. Future studies can focus on developing innovative and contextualized approaches that account for current and emerging healthcare system challenges in Africa. Additionally, we have suggested areas where policy can be used to enable the equitable use of these tools across the continent. These insights can guide the adoption of these technologies in African countries and in similar low-resource settings globally. To leverage the full capabilities of these tools, funders and global and national organizations should work together to advance research opportunities and policies."

Reviewer #3 (Remarks to the Author):

I co-reviewed this manuscript with one of the reviewers who provided the listed reports. This is part of the Nature Communications initiative to facilitate training in peer review and to provide appropriate recognition for Early Career Researchers who co-review manuscripts.

Reviewer #4 (Remarks to the Author):

Initial comments
While I appreciate the work done by the authors, I am of the view that:
authors have not provided detailed noteworthy results in their study. The focus of the study was on AI , but scanty results were reported in that direction. A lot needs to be done on the subject since the extracted studies are still available to the authors.
This work could be significant of the review comments are heeded to, and necessary revisions made. authors made some interesting recommendations that were not clearly revealed by their study (at least in their findings). Since the data are still available, authors could flesh up their findings to support their recommendations.
The methods section could also be improved based on the review comments.

We thank the reviewer for their comments. We have provided point-by-point responses to the issues raised below.

Topic

1. The topic should be modified to suit the content.

We changed the title based on reviewer #1's suggestion to: "A Scoping Review of the Use of Artificial Intelligence and Machine Learning via Mobile Technology and Social Media for Health Research in Africa".

Abstract

1. The abstract does not capture a clear problem and gap to be filled by the study.

We thank the reviewer for this comment. We edited the abstract. Note that we are restricted to 150 words, which limits how much information can be included.

"The combination of mobile technologies and social media with Artificial Intelligence (AI) opens new opportunities for multi-modal data generation, analysis, and inferences for various health applications. To investigate how these tools are being used for health applications in Africa, we conducted a scoping review using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis approach. We screened 469 articles and synthesized 116. We included 29 studies documenting the use of a broad range of advanced and straightforward machine-learning techniques to study infectious and chronic diseases such as COVID-19 (4 studies, 13.8%), malaria (5, 17.2%), and cervical cancer (2, 6.9%). Countries with high internet and mobile phone usage had higher representation. Based on identified gaps, we make research and policy recommendations to make these tools more helpful in advancing health in Africa. These include investing in studies on chronic diseases and implementing frameworks to address geographic inequity."

2. There is no information on the standard approach (or framework) used for the systematic /scoping review. For instance, there is the popular PRISMA flow that is often used as an approach to the entire work selection process.

Please see our previous response. PRISMA was discussed in the manuscript but was previously left out of the abstract.

3. The findings in the abstract are not too compelling to arouse interest of readers and even policy-makers. Authors should rather provide key findings that are "heavy" relevance to the continent.

We appreciate this comment. We have updated the abstract accordingly.

Introduction

1. In an attempt to establish a gap for this research, authors have not sufficiently linked the second and third paragraphs in page four. There is a clear disjoint. Examine these statements

"The utility of these digital tools extends to a host of applications, including disease management and diagnosis, tracking infectious disease trends and chronic disease risk factors, pharmacovigilance, and analyzing population dynamics during public health crises. Similar tools have enabled organizations like the U.S. Centers for Disease Control (CDC) and WHO to use digital surveillance for early disease outbreak detection, affirming the importance of such tools for epidemic intelligence as recognized by the 2005 International Health Regulations.3,23,24 " AND

"However, comprehensive reviews on how AI has been used with mobile phones and social media for health research and applications in Africa have yet to be made available. Several reviews have focused on mobile phone use and social media applications for health in...". There is no linkage between the two halves. Kindly reconcile.

Thank you for highlighting this point. We agree that better linkage between these statements can improve the flow and clarity of the introduction. We have revised the text to clearly connect the broad utility of digital tools in global health surveillance with the specific gap in comprehensive reviews focused on AI applications via mobile phones and social media in Africa. This has strengthened the rationale for our study.

The text has been edited as follows:

"...These applications align with the Sustainable Development Goals (SDGs) 3[22]; they offer a viable, scalable solution to pressing health challenges confronting many African countries. The utility of these digital tools extends to diverse applications, including disease management, diagnosis, and tracking infectious disease trends, which have supported organizations like the U.S. Centers for Disease Control (CDC) and WHO in early outbreak detection and epidemic intelligence, as recognized by the 2005 International Health Regulations.[3,23,24]

Despite this global progress, we do not know to what extent these tools, specifically mobile phones and social media, have been used in combination with AI for health applications in Africa. Several reviews have focused on mobile phone use and social media applications for health in Africa, including applications for disease surveillance, [25] diagnosis and treatment, [26] health literacy,[27] adolescents' use of sexual and reproductive health services,[28] point of care diagnosis,[29] and challenges with scaling up,[30] among others. However, none has explicitly focused on how AI has been combined with these technologies."

2. There are no clear research questions that this review seeks to answer. Kindly provide clear research questions at the end of the introduction section. This help with readability and reading expectation. this has made it very difficult to benchmark the results against specific research questions.

Please see our stated aims, which we defined to align with the focus of a scoping review:

"In this scoping review, we aim to assess how AI/ML methods have been combined with social media and mobile phones to study health and disease dynamics in Africa. This involves assessing the various AI models used; diseases, conditions and populations studied; types of social media platforms considered; and geographic representation of African countries to help guide future applications. Additionally, we identify shortcomings of current applications and future opportunities for health applications, research priorities and policy innovations in Africa."

Methodology

1. There is no clear and detailed methodology section. The methods have somewhat been combined with the results. This is problematic as it defeats the structure of scientific writing and systematic/scoping reviews.

Thank you for the feedback. We appreciate the importance of a clear and comprehensive methodology section. In accordance with the Nature journal format, our manuscript is structured as follows: Introduction, Results, Discussion, Conclusion and then Methods.

2. Provide a detailed methods section that clearly spells out:

i. comprehensive search terms that represents all the needed components of the study (there is the need to bring all the names of the African countries in your search key terms)

ii. databases

iii. eligibility criteria

iv. inclusion criteria

v. exclusion criteria

vi. reliability of included studies

vii. thematic coding for analysis

viii. explanation to the PRISMA flow of studies selection process

ix. explanation and justification for the base year and year range.

All methodological details—including search terms, databases, eligibility and inclusion/exclusion criteria, study reliability assessment, thematic coding, PRISMA flow, and the justification for the study period are included within the Methods section. We have carefully ensured that these elements are described to maintain transparency and reproducibility.

Results

1. Figure (b) is confusing (Which figure (b)?). This is because the study focuses on AI mixed with mobile phones and social media, but the figure only depicts mobile phones and social media.

Thank you for your comment regarding Figure 2(b). The figure aims to illustrate the number of articles published by year that involve the applications of AI via mobile phones and social media separately. To meet the study criteria, all articles use AI/ML. We have captured the diversity of AI/ML methods in the tables. The purpose of the figure is to compare the number of articles focusing on social media vs. mobile phones.

We have clarified the figure's purpose in the manuscript to improve reader understanding. "Figure 2. (a) The number of times each country was included in a study in the review. (b) The number of studies each year that used social media or mobile phones that were included in the review. All listed studies used AI or ML as mentioned in the study inclusion criteria. (c) Percentage of authors from African institutions and institutions outside Africa. The half pies are used to emphasize the difference in proportions. The small pie represents 23% of the larger pie."

2. Findings are insufficient on AI since that is the major focus of this study (at least from my reading). I expect findings such as the categories of usage (which has been reported but scantly discussed). Effectiveness of theses AI tools/approaches as opposed to just mobile phones and social media; Challenges in using these AI tools/approached; possible solutions to the use of these AI tools/approaches.

We appreciate the reviewers' comments. We have a section that focuses on the effectiveness of using AI/ML. Since the focus of the study is the use of these technologies via mobile phones and social media, we cannot provide a discussion beyond that. We have also identified major challenges and make recommendations to improve the adoption of these tools across Africa.

Discussion

1. The discussion section is very scanty and uninformative. There should be more reflective and critical discourse on the subject.

We acknowledge the importance of a reflective and critical discussion. We aimed to balance depth with conciseness while ensuring that key points, limitations, and suggestions for future research are all included within the discussion section. We have clearly delineated these aspects within dedicated subsections to maintain clarity. We have revisited the manuscript to enhance the critical discourse within the available word count and ensure the discussion is as informative as possible based on all reviewers' comments.

2. Better for authors to separate discussions from limitations, and suggestions for future research.

We appreciate this feedback. We have organized the manuscript based on journal guidelines.

Thank you for the opportunity to review your paper. I hope the paper could be improved to qualify for publication in this reputable journal.

Best wishes.

Topic

1. The topic should be modified to suit the content.

Abstract

1. The abstract does not capture a clear problem and gap to be filled by the study.
2. There is no information on the standard approach (or framework) used for the systematic /scopingreview. For instance, there is the popular PRISMA flow that is often used as an approach to the entire work selection process.
3. The findings in the abstract are not too compelling to arouse interest of readers and even policy-makers. Authors should rather provide key findings that are "heavy" relevance to the continent.

Introduction

1. In an attempt to establish a gap for this research, authors have not sufficiently linked the second and third paragraphs in page four. There is a clear disjoint. Examine these statements

"The utility of these digital tools extends to a host of applications, including disease management and diagnosis, tracking infectious disease trends and chronic disease risk factors, pharmacovigilance, and analyzing population dynamics during public health crises. Similar tools have enabled organizations like the U.S. Centers for Disease Control (CDC) and WHO to use digital surveillance for early disease outbreak detection, affirming the importance of such tools for epidemic intelligence as recognized by the 2005 International Health Regulations.3,23,24 " AND

"However, comprehensive reviews on how AI has been used with mobile phones and social media for health research and applications in Africa have yet to be made available. Several reviews have focused on mobile phone use and social media applications for health in…". There is no linkage between the two halves. Kindly reconcile.

2. There are no clear research questions that this review seeks to answer. Kindly provide clear research questions at the end of the introduction section. This help with readability and reading expectation. this has made it very difficult to benchmark the results against specific research questions.

Methodology

1. There is no clear and detailed methodology section. The methods have somewhat been combined with the results. This is problematic as it defeats the structure of scientific writing and systematic/scoping reviews.

2. Provide a detailed methods section that clearly spells out:
i. comprehensive search terms that represents all the needed components of the study (there is the need to bring all the names of the African countries in your search key terms)
ii. databases
iii. eligibility criteria
iv. inclusion criteria
v. exclusion criteria
vi. reliability of included studies

vii. thematic coding for analysis
viii. explanation to the PRISMA flow of studies selection process
ix. explanation and justification for the base year and year range.

Results
1. Figure (b) is confusing. This is because the study focuses on AI mixed with mobile phones and social media, but the figure only depicts mobile phones and social media.
2. Findings are insufficient on AI since that is the major focus of this study (at least from my reading). I expect findings such as the categories of usage (which has been reported but scantly discussed). Effectiveness of theses AI tools/approaches as opposed to just mobile phones and social media; Challenges in sing these AI tools/approached; possible solutions to the use of these AI tools/approaches.

Discussion
1. The discussion section is very scanty and uninformative. There should be more reflective and critical discourse on the subject.
2. Better for authors to separate discussions from limitations, and suggestions for future research.

Thank you for the opportunity to review your paper. I hope the paper could be improved to qualify for publication in this reputable journal.
Best wishes.